



01-10-03

AF/2800

#14

IN THE UNITED STATES  
PATENT AND TRADEMARK OFFICE

"Express Mail" Mailing Label

Number: EV 85724103/2105Date of Deposit 1/24/02

Inventor(s): **Frank Hui,  
Yifeng Yan, and  
Allen Yen**

Case: **3-6-16**

Serial No.: **09/653,295**

Filing Date: **8/31/00**

Examiner: **Nguyen, Cuong**

Group Art Unit: **2815**

Title: **Stacked Structure for Parallel Capacitors and Method of Fabrication**

I hereby certify that this Petition is  
being deposited with the United States  
Postal Service "Express Mail Post Office to  
Addressee" service under 37 CFR 1.10 on  
the date indicated above and is addressed to  
this Commissioner of Patents and  
Trademarks Washington, D.C. 20231.

FRED ROMANO Ferdinand M. Romano  
Printed name of person mailing paper or fee

Ferdinand M. Romano  
Signature of person mailing paper or fee

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D. C. 20231

**PETITION UNDER RULE 144 REQUESTING THE COMMISSIONER TO  
REVIEW AND OVERRULE RESTRICTION REQUIREMENT**

Applicants now come before the Commissioner of Patents and Trademarks and petition the Commissioner to intervene in the prosecution of the above-referenced application and to reverse the restriction requirement made final. By all appearances the restriction requirement was made without any basis in fact and is completely in error.

This petition is filed in accordance with Rule 144 and is filed prior to an appeal from the examiner's final rejection of the elected claims. This petition is necessitated because the examiner has not addressed the substance of applicants' argument.

**1. STATUS OF THE APPLICATION**

Claims 1 – 10 are pending. Claims 7-10 have been withdrawn from examination while the elected claims 1 – 6 were finally rejected in the Office Action mailed August 26, 2002. After submitting a Request for Reconsideration After Final Rejection, a Notice of Appeal was filed on November 25, 2002.

**2. BACKGROUND**

**A. The Examiner's Basis for the Restriction Requirement**

In the Office action mailed 10/24/01 the examiner imposed a restriction requirement between claims 1-6 "drawn to a semiconductor device, classified in class

TECHNOLOGY CENTER 2800

JAN 13 2003

RECEIVED

257, subclass 306” and claims 7 – 10 “drawn to a method of making a semiconductor device, classified in class 438, subclass 100+.” The only basis presented for concluding that the inventions are distinct is now quoted from page 2 of the subject office action:

**“The inventions are distinct, each from the other because of the following reasons:**

**Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case unpatentability of the Group I invention would not necessarily imply unpatentability of the Group II invention, since the device of the Group I invention could be made by processes materially different from those of Group II invention, for example in claim 7, selectively forming conductive layers without the etching step.**

**Because the inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their classification, restriction for examination purposes as indicated is proper.”**

#### **B. Applicants Have Demonstrated That the Restriction Requirement is in Error.**

Applicants have three times presented explanations to the examiner as why the restriction requirement is in error. In the response filed on 11/19/01, electing to prosecute the claims 1-6 of Group I, it was respectfully submitted that the requirement for restriction is in error and the following reasons were provided as reason to withdraw the requirement.

**“The examiner asserts that the inventions of Groups I and II are distinct because the device of Group I could be made with a process materially different from those of the Group II invention and then suggests that the process of Claim 7 could be modified to delete the etching step in order to form the device of Group I.**

**First, mere removal of the element of a claim does not imply that the claimed process would be enabled by means other than the removed step. Furthermore, removal of a claim element broadens the claim while the deleted claim element remains within the scope of the claimed subject matter. Thus it is erroneous to assert that the mere removal of the etching step from Claim 7 would result in a materially different process. Further, the examiner has not suggested any step to replace an etching step in order to fabricate the device of Claim 1.”**

In considering applicants’ position it should also be noted that even if claim 7 were re-written to incorporate the recitation “selectively forming an uppermost of the conductive layers to include an opening therein ...” the scope of the recitation would still include etching.

#### **C. All of the Examiner’s Responses to the Traversals have Been Incomplete.**

In the Office Action mailed 1/28/02 the examiner addressed only a portion of applicants’ traversal, and paraphrased that portion of the traversal as follows:

**“...the removal of the etching step does not imply that the claimed process would be enabled by means other [sic] process”**

and the examiner referred to the prior office action as

**“clearly show[ing] that the alternative method proposed by the examiner would be distinct from the process claimed ...”**

Still without providing any support for his contentions, the examiner merely described his proposed alternative method as

**“selectively forming conductive layers at desired areas instead of forming the conductive layers and the [sic] remove the unwanted portions of conductive layers by etching step.”**

In fact, the examiner has done no more than speculate that there could be a distinct invention that involves some abstract means of “selective formation” and the examiner fails to consider another related implication resulting from his piecemeal removal of the so-called “etching step”. That is, the subject step of claim 7 recites:

*“etching an opening (88) in an upper most (56) of the conductive layers and extending the opening through an adjoining dielectric layer to a first underlying conductor layer (54).”* [reference numerals added solely for purposes of illustration and not limitation of claim scope]

As an example embodiment the detailed description (see page 7, first full paragraph) identifies such an opening 88 in an upper layer 56 (see Figs. 4 and 5) which extends through an adjoining dielectric layer 60 (see Figs. 1 and 6). As described at page 7, at least a portion of the opening 88 is formed in the same etch step which the examiner seeks to remove for the sole purpose of imposing a restriction.

Thus, the examiner fails to address that even if he could remove the “etch step” to provide a materially different “invention” it would also be necessary to provide an alternate means (other than etching) to form the opening 88. It is submitted that the examiner insists on imposing an incomplete and apparently unworkable concept. The undersigned is not aware of any technique, other than an etch step, for creating an opening (such as opening 88) in a dielectric layer formed over a conductive runner in a semiconductor device. Nor is the undersigned aware of any practical, or even hypothetical, means (other than etching) in order to **selectively form** “a stack of alternating conductor and dielectric layers between the first conductive runner and the second conductive runner ...” See claim 7.

As best presented, the examiner’s speculative approach is technically unfounded. This is as evidenced by the examiner’s subsequent words in the 1/28/02 office action (see again page 2) where he states in part that the alternative method proposed by the examiner is one of “selectively forming conductive layers at desired areas instead of forming the conductive layers and the [sic] remove the unwanted portions of conductive layers by etching step.” This hypothetical construct is being pushed without regard to the well known fact that when “forming a stack of alternating conductor and dielectric

layers” (as recited in claim 7), e.g., between the metalization levels of a semiconductor device, both the conductors (e.g., see layers 52, 54, 56 of Figs 1, 4 and 5) and the associated intervening insulators (e.g., layers 58, 60) are initially deposited as blanket layers and are then etched in order to form the desired pattern. Conventional pattern and etch steps are the only method of record to selectively form such patterned conductive layers, and conventional pattern and etch steps are the only method of record to selectively form the intervening insulators. So, the undersigned retains a complete lack of understanding as to how the examiner can insist that there is some non-etch technique for “selectively forming [such] conductive layers without the etching step.”

While the examiner has contended that the recited “opening” may be formed by “selectively forming conductive layers without the etching step” this also ignores the fact that applicants teach in the detailed description that the very same layers are already selectively formed before the opening is formed. This is evidenced by the difference between the initial deposit of the conductor and insulator layers 52, 54, 56, 58 and 60 as shown in Fig. 4 and the resulting Fig. 5 structure after the final layers have been selectively formed. In fact, all such deposited layers are selectively formed by a subtractive metal etch process.

In summary, the examiner has **not** “*clearly*” carried his burden of showing a distinct invention and his contention that selectively forming the claimed conductive layers avoids an etch step is misplaced.

In the remarks accompanying the amendment filed on 5/22/02 the undersigned made of record that the examiner’s restriction requirement remains an error and, contrary to the examiner’s assertion, it was ***not*** clearly established that the Group I and Group II inventions are distinct. It was also requested that the examiner confer with Mr. Tom Thomas, his supervisor, to discuss the merits of the restriction requirement.

In the final Office Action mailed 11/26/02 the examiner did no more than restate the same position:

“... in the last office action, the examiner clearly point out that there is a method other than the method in the present intention to produce the claimed structure. It was clearly established that Group I and II inventions are in fact distinct in Paper No. 4.”

As discussed above, at no time has any correct basis for the restriction requirement been “clearly established”. Accordingly, in filing a request for reconsideration after final rejection on 10/28/02 the undersigned urged the following:

**“If the examiner had ever clearly pointed out a correct basis for the restriction requirement, the undersigned would not continue to disagree. It has already been suggested that if the examiner still disagrees with the undersigned’s position that the examiner should confer with his supervisor, Mr. Tom Thomas, to discuss the merits of the restriction requirement. Again, it should be noted that the broadening of a claim by removal of a step does not result in creation of a different species of that claim.**

Accordingly, it is requested that the examiner immediately review the withdrawn claims, and, if appropriate, further search the subject matter of claims 1-10 since none of the art of record is sufficient for rejecting any of applicants' claims. Applicants request that the examiner endeavor to do so in order to ensure a more thorough investigation of the invention."

### **3. REASONS FOR REMOVAL OF THE RESTRICTION REQUIREMENT INCLUDE QUALITY CONCERNS**

The Office is required to analyze the substance of claims before making restriction requirements. Otherwise, an insufficient or piecemeal examination may result. In the present application, if such analysis had been made, the record suggests that it is of uncertain technical merit. Further, competent searches will normally be broader than a single subclass and restrictions should not be justified because searches required for two different claims are not 100 percent identical. In fact, contrary to a conclusion that the inventions are so distinct as to have acquired a separate status in the art, the notice of References Cited suggests that the examiner has searched some Group II subclasses in the course of examining Group I claims.

However, to the extent art relevant to the claims of Group I may be present in still other subclasses relating to the claims of Group II, the applicants are disappointed that the examiner will not provide a more comprehensive search. This seems especially relevant in view of the marginally relevant art which the examiner cites to sustain a final rejection of the elected claims. In fact, it appears that a more comprehensive understanding and examination of each claim group will result from examining all of the claims at once.

For these reasons the restriction requirement should be reversed. At a minimum it is requested that the examiner be directed to search all of the classes relevant to the Group II claims in order to assure that the most pertinent art is considered.

### **4. TECHNICAL ERROR RENDERS IT PROPER TO REVERSE THE RESTRICTION REQUIREMENT**

The product as claimed (Group I) cannot be made by another and materially different process than that covered by the Group II claims. This fundamental mistake in the restriction requirement has already been made clear in the above argument. As best understood, the examiner believes there is an unspecified non-etch method of selectively forming the conductive layers as recited in claim 7. The examiner has not proposed and apparently cannot propose how one might possibly "selectively form" such layers. Further, if the examiner had offered such information in presenting the restriction requirement the undersigned could have and probably would have amended claim 7 as a matter of right in order to cover such alternate methods. In fact, it is not known that any viable method exists for fabricating the invention of Group I except those covered by the claims of Group II.

Because applicants *clearly* identified deficiencies in the examiner's argument, it was incumbent upon the examiner to carry the burden of showing that his approach can result in at least one feasible and materially different method of making a Group I device. The examiner failed to carry this burden and the requirement cannot be sustained.

## 5. CONCLUSION

It is not apparent there exists any process to make the product of Group I which differs materially from the process of Group II. Except for repeating conclusory statements to the contrary, the examiner has not countered applicant's basis for traversal.

The technical errors in the examiner's restriction requirement have been described. There are no statements in the record which run counter to a conclusion that the examiner's argument is technically flawed and legally deficient. Furthermore, inclinations to restrict claims should be balanced by both the needs for economy and a thorough examination of the claims.

For the above-stated reasons the restriction requirement is in error and applicants should not be prevented from having all of their claims fully examined in this application. Intervention by the Commissioner to reverse the restriction requirement is therefore requested.

Respectfully submitted,

By Ferdinand M. Romano  
Ferdinand M. Romano  
Reg. No. 32,752  
407-371-3250

Date: 9 January 2003